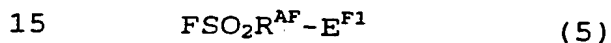
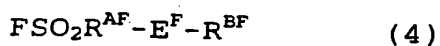
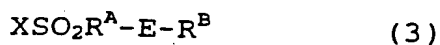


WHAT IS CLAIMED IS:

1. A process for producing a fluorine atom-containing sulfonyl fluoride compound, which comprises reacting a compound of the following formula (1) with a compound of the following formula (2) to form a compound of the formula (3), then, reacting the compound of the formula (3) with fluorine in a liquid phase to form a compound of the following formula (4), and further, decomposing the compound of the formula (4) to obtain a compound of the following formula (5):



wherein R^{A} is a bivalent organic group, E^1 is a monovalent reactive group, R^{B} is a monovalent organic group, E^2 is a monovalent reactive group which is reactive with E^1 , E is a bivalent connecting group formed by the reaction of E^1 with E^2 , R^{AF} is the same group as R^{A} , or a bivalent organic group formed by the fluorination of R^{A} , R^{BF} is the same group as R^{B} , or a monovalent organic group formed by the fluorination of R^{B} , E^{F} is the same group as E , or a bivalent connecting group formed by the fluorination of E , E^{F1} is a monovalent group formed by the decomposition of E^{F} , and X is a halogen atom, provided that at least one of R^{A} , R^{B} and E is a group

which can be fluorinated, and at least one of R^{AF} , R^{BF} and E^F is a group formed by the fluorination of R^A , R^B and E , respectively.

2. The process for producing a fluorine atom-containing
5 sulfonyl fluoride compound according to Claim 1, wherein
X is a fluorine atom.

3. The process for producing a fluorine atom-containing
sulfonyl fluoride compound according to Claim 1, wherein
the fluorine content in the compound of the formula (3)
10 is at least 30 mass%.

4. The process for producing a fluorine atom-containing
sulfonyl fluoride compound according to Claim 1, wherein
the molecular weight of the compound of the formula (3)
is from 200 to 1,000.

15 5. The process for producing a fluorine atom-containing
sulfonyl fluoride compound according to Claim 1, wherein
 R^{AF} is a bivalent organic group selected from the group
consisting of a perfluoro bivalent saturated hydrocarbon
group, a perfluoro(partially halogeno bivalent saturated
20 hydrocarbon) group, a perfluoro(hetero atom-containing
bivalent saturated hydrocarbon) group, and a
perfluoro(partially halogeno(hetero atom-containing
bivalent saturated hydrocarbon)) group, and R^{BF} is a
monovalent organic group selected from the group
25 consisting of a perfluoro monovalent saturated
hydrocarbon group, a perfluoro(partially halogeno
monovalent saturated hydrocarbon) group, a

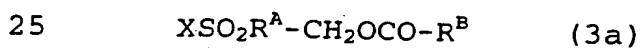
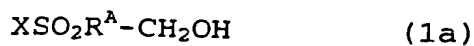
perfluoro(hetero atom-containing monovalent saturated hydrocarbon) group, and a perfluoro(partially halogeno(hetero atom-containing monovalent saturated hydrocarbon)) group.

- 5 6. The process for producing a fluorine atom-containing sulfonyl fluoride compounds according to Claim 1, wherein the compound of the formula (4) is decomposed to obtain not only the compound of the formula (5), but also a compound of the following formula (6):



wherein E^{F2} is a monovalent group formed by the decomposition of E^F , which may be the same as or different from E^{F1} , and R^{BF} is as defined above.

7. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 1, wherein
15 the compound of the formula (1) is a compound of the following formula (1a), the compound of the formula (2) is a compound of the following formula (2a), the compound of the formula (3) is a compound of the following formula
20 (3a), the compound of the formula (4) is a compound of the following formula (4a), and the compound of the formula (5) is a compound of the following formula (5a):



wherein Y is a halogen atom which is the same as or different from X, and R^A , R^B , R^{AF} and R^{BF} are as defined above.

8. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 7, wherein the compound of the formula (4a) is decomposed to obtain not only the compound of the formula (5a), but also a compound of the following formula (6a):



10 wherein R^{BF} is as defined above.

9. The process for producing a fluorine atom-containing sulfonyl fluoride compound according to Claim 8, wherein the compound of the formula (2a) has the same structure as the compound of the formula (6a), and at least a part of the compound of the formula (6a) obtained from the reaction product obtained by the decomposition of the compound of the formula (4a), is used as at least a part of the compound of the formula (2a) to react with the compound of the formula (1a), to continuously obtain the compound of the formula (5a).

10. A compound of the following formula (I) or a compound of the following formula (II):

